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DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATE DOCUMENTS

Prepared By

STATE OF MONTANA
DEPARTMENT OF HIGHWAYS

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DRAFT ENVIRONMENTAL STATEMENT

ADMINISTRATIVE ACTION

for

PROJECT F-20(1)
U.S. 191 SPUR

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H.J. ANDERSON, DIRECTOR OF HIGHWAYS

2/16/72
Date

BY Jack R. Beckert
ACTING ADMINISTRATOR
ENGINEERING DIVISION

CLEARED BY FEDERAL HIGHWAY ADMINISTRATION FOR CIRCULATION AND COMMENTS

2/9/72
Date

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INTRODUCTION

The purpose of this statement is to assure that the human environment is carefully considered and national environmental goals are met when developing federally financed highway improvements.

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SUMMARY SHEET

I. TYPE OF ACTION

(X)	Administrative	( )	Legislative
(X)	Draft	( )	Final
(X)	Environmental Statement		
( )	Combination Environmental/Section 4(f) Statement		

II. PROJECT DESCRIPTION

The project begins on U.S. 191 near the mouth of the West Fork of the West Gallatin River about midway between Bozeman and West Yellowstone, Montana. It extends up the West Fork drainage a distance of 9.7± miles, to a point near the base of Lone Mountain and very near the divide between the Gallatin and Madison Rivers. The project is a federal-aid primary spur to federal-aid Primary Route 50. It is located in Gallatin and Madison Counties. Exhibits A and B show the location of the project.

III. ENVIRONMENTAL IMPACTS

The project will provide a fast, safe and efficient transportation facility for the traveling public. It will enable them to reach a newly developed recreational area for both recreational and employment opportunities. The area being served is the site of a $20 million year-round resort complex being built by Big Sky of Montana, Inc.

The economic impact of this development will be felt by a large area of southwestern Montana. Gallatin and Madison Counties will share in a substantially larger tax base. Restaurants, gas stations, hotels and motels, airlines and other tourist oriented businesses will benefit. Employment at Big Sky will provide approximately 300 jobs.

The West Fork of the West Gallatin River, where the project is located, has in the past been an undeveloped area used primarily for timber harvesting, dude ranching, cattle ranching and limited recreational activities. The changing land use in the area represents a major environmental consideration. The change in land use is underway at the present time and is not being caused by the proposed highway construction. The highway project will, however, complement and act as a catalyst to this change. The construction of this project will put this greatly intensified use of the area on a modern highway facility rather than the existing low class logging road or some modification of it.

During construction and for a short period of time after construction, there will be an increase in air and water pollution caused by the construction activity. The contractor will be required to meet state air pollution standards and temporary erosion control methods, topsoil replacement and seeding will be included in the contract in order to keep air and water pollution to a minimum.

Some minor adjustments may occur in the behavior of wildlife species. Although a wide variety of wildlife inhabit the area, it is not an important winter range or the exclusive habitat of any of these species. Most of the wildlife will stay in the area with only minor adjustments in their behavior.

Agencies and organizations reviewing this statement are referred to the U.S. Forest Service Final Environmental Statement on the Gallatin Exchange Numbers 2 and 3 for a fuller discussion of the overall environmental impact of the entire Big Sky Development, including the original highway planning.

IV. ALTERNATIVES

A study of five alternate alignments has been made for a portion of the project. Deviation from the existing roadway corridor at this location is necessitated by an active landslide. The environmental impacts of the alternates do not vary greatly. The study is concerned more with the engineering aspects of establishing an alignment that will reach the desired elevation with a reasonable grade. In addition to grade, the selection of the best alternate must consider cost, horizontal curvature, cut and fill scars and the geological problems encountered.

The "do-nothing" alternative may have appeal to the group of people who would prefer that Big Sky not be built. However, not building the road would not insure that Big Sky would not be built as the lower village complex is already partially built. It could be more harmful to the environment to have traffic using a substandard roadway than to have a highway built to modern standards with proper provision made for drainage and erosion control.

V. FEDERAL, STATE AND LOCAL AGENCIES AND OTHER ORGANIZATIONS FROM WHICH COMMENTS WERE REQUESTED:

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Office of Civil Defense
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Corps of Engineers
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Department of Health, Education and Welfare
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VI. DATE DRAFT STATEMENT AVAILABLE TO CEQ: February 29, 1972

ENVIRONMENTAL STATEMENT

I. DESCRIPTION OF THE PROPOSED HIGHWAY IMPROVEMENT AND ITS SURROUNDINGS

A. PROJECT DESCRIPTION

The project is located in Gallatin and Madison Counties in southwestern Montana. It begins on U.S. 191 near the mouth of the West Fork of the West Gallatin River about midway between Bozeman and West Yellowstone. It extends up the West Fork drainage a distance of 9.7± miles, to a point near the base of Lone Mountain, very near the divide between the Gallatin and Madison Rivers.

The new roadway will provide a 34-foot paved surface with 2-12 foot driving lanes and 2-5 foot shoulders. Inslopes will have 6:1 safety slopes with a minimum ditch width of 15 feet. Cut and fill slopes will vary according to their height and the type of material encountered.

Drainage structures will be provided based on hydrologic and hydraulic studies. The streams involved are not large enough to require bridge structures. Minor channel work at culvert ends will be the only channel changes required.

Design standards for the project will be in accordance with the State of Montana, Department of Highways' Design Standards for Primary and Secondary Highways. Maximum grades of 7% and maximum horizontal curvature of $12^{\circ}30'$ will be used in the design. Minimum right-of-way width will be 80 feet on each side of centerline.

Where physical or environmental conditions indicate that exceptions to the standards are in the best interest of total design, grades in excess of 7% and curvature sharper than $12^{\circ}30'$ may be utilized.

The design year average daily traffic is 1400 vehicles per day. The estimated new winter trips generated two years after completion of the road is 443 vehicles per day.

B. PROJECT HISTORY

Upon retirement from NBC, former newscaster, Chet Huntley, announced the proposed development of Big Sky of Montana, a year-round resort complex to be built on the West Fork of the West Gallatin River. Amid considerable controversy over the environmental impact of the development, construction is now underway on a golf course, condominiums, a visitor center and other facilities. To date, construction has been primarily in the Meadow Village area with building construction at the Mountain Village area being postponed pending the outcome of a proposed land exchange involving the U.S. Forest Service and Burlington Northern, Inc.

Although the Mountain Village will be built with or without the land exchange, the final design configuration will depend upon whether Big Sky owns or leases the land. Mountain Village site preparation has been under way since the summer of 1971.

With the construction of a large recreational complex such as Big Sky comes the need for improved transportation facilities. The proposed project will provide the necessary all weather highway access to Big Sky.

Construction contracts were awarded in July 1971 for construction of a structure across the West Fork and 3 miles of gravel surfaced roadway from U S. 191 to the Meadow Village area. No federal money was used for this construction. This section of roadway is being built to standards comparable to the standards being used on the remainder of the project. It is anticipated that contracts for the upper 6.7± miles will be awarded in 1973.

On April 30, 1971, the Department of Highways made application to the Federal Highway Administration for designation of a Federal-Aid Primary Spur to serve this area. On August 20, 1971, the spur was approved. This will allow future contracts to be built as part of the Montana Federal-Aid Primary System.

On August 12, 1971, application was also made to the Federal Highway Administration for designation of an Economic Growth Center in the West Fork drainage. This application was approved on November 2, 1971, thereby making the federal-aid matching ratio 20% higher than on normal federal-aid primary projects.

Montana State University is conducting a 3-year study entitled "The Impact of a Large Recreational Development upon a Semi-Primitive Environment: A Case Study". This project is being funded by the National Science Foundation and a preliminary report dated April, 1970 has been published. This study will document the effects this development has on the area and will provide a planning guide for future developments elsewhere in the state or nation.

The U.S. Forest Service prepared an Environment Statement in conjunction with their proposed land exchanges with Burlington-Northern, Inc. Their Final Environmental Statement, dated July 1, 1971, provides a fuller discussion of the overall impact of the entire Big Sky Development.

This statement will make use of these publications and other correspondence and reports where the items being discussed are pertinent.

C. DESCRIPTION OF EXISTING PROJECT ENVIRONMENT

1. Land Use

Until recently, the West Fork has been used primarily for grazing and timber harvesting. A limited amount of recreational activity and a few summer homes also existed. With the development of the Big Sky Project, the land use will become primarily recreational.

Past recreational activities were limited to fishing, hunting, hiking, camping, snowmobiling and horseback riding. In the future, skiing, golf, tennis, swimming and other sports will be added to the recreational pursuits available. Big Sky Inc. is a land development corporation and as such will be marketing home sites and condominiums. Their recreational development is designed to attract buyers who will use these facilities.

Montana State University scientists have compiled a General Soils Map and Soil Interpretation for Land Use Planning and Development in the Gallatin Canyon Area. This map shows soil classifications and limitations for various land uses. This map is availble from the Montana Agricultural Experiment Station, Montana State University, Bozeman, Montana.

2. Terrain

The project is located in the mountains of southwestern Montana. It is within the boundaries of the Gallatin National Forest and about 50 miles north of Yellowstone National Park. Immediately to the north lies the Spanish Peaks Primitive Area. The surrounding mountains are a part of the Madison Mountain Range. Lone Mountain is the dominant physical characteristic as it stands by itself when viewed from the Gallatin River at the mouth of the West Fork.

The West Fork drainage contains open meadows in its lower reaches and timber covered ridges at higher elevations. The West Fork branches into the South Fork, the Middle Fork and the North Fork, with these streams being fed by smaller tributaries. There are no lakes of any size in the area.

3. Geology

The predominant rock types in the West Fork Basin are shales and sandstones of the Colorado Formation. These are overlain by glacial tills and alluvial deposits ranging in depth to 50 feet.

In conjunction with the National Science Foundation, Montana State University scientists have made soils and geological studies of the area. Their preliminary report of April 1971, "The Impact of a Large Recreational Development upon a Semi-Primitive Environment: A Case Study", states "Systematic study of the geological factors bearing on future development in the West Fork Basin has revealed that selective methods of procedure will be most beneficial where construction is concerned. For instance, certain rock types may be considered particularly fragile in an environmental sense. Of these, the worst behaver is the black shale and sandstone sequence of Cretaceous age which occupies more surface area in the West Fork Basin than any other rock type. Since the shale possesses the most critical limitations insofar as weight-bearing capacity, slope stablility and water passing ability are concerned, it alone dominates the scene when considering dams, highways, heavy building and water development or disposal facilities.

"Gravels which have been spread either from the fronts of glaciers, or by streams in the usual course of flood plain development, thinly blanket the above mentioned shale and sandsone sequence in the basin flats. In no case have we discovered thicknesses exceeding 50 feet; most of the gravel sheet is about 30 feet in thickness. The rapid discharge of any waste water through most of these gravels will result in rapid transmittal of that water to the top of the underlying black shale stratum, at which plane water will tend to be concentrated and run off toward the lower basin areas, eventually discharging directly into the ground water system, but particularly into the direct stream of the Gallatin River and its tributaries. It is advisable, therefore, that waste water discharged into the gravels be relatively free of contamination.

"Landslide-prone formations in this area present a challenge to all construction planning. The landscape is literally dominated in the sloping areas by stabilized landslides which ran, probably slowly, in response to various climatic influences and glacial oversteeping during the past few hundred thousand years. If these landslides are intercepted for roadways, foundations and other construction, it can be expected that the tenuous equilibrium under which they have been stabilized will be upset and further movement will result. Proper drainage, proper slope in highway cuts, compensating backfill and other engineering procedures will minimize such disturbance and save money in the long run.

"Within the past thousand years, in the alpine and subalpine zones of the West Fork Basin, so-called rock glaciers have continued to move large masses of rubble to lower elevations. These slowly moving streams of rock, some of which are a quarter of a mile wide and a half mile long, have had a core of ice in the past comparable to glacial ice. Although the origin of this ice is attributable to a variety of alpine conditions., it is not precisely understood which of these prevailed at this particular location in the recent past. Further, it is predictable that certain ice-cored rock streams or 'rock glaciers' may yet be active on the east flank of Lone Mountain where evidence of recent movement can be observed. In addition to the possibility that the ice, if any, would be a source of springs emanating from the volcanic rubble at the base of the upper village site in Section 30, such ice would also cause instability if manmade facilities are installed within its domain. Exploratory excavation into the rubble by bull-dozing should reveal whether or not such ice cores are present and therefore may dictate what kinds of structures can be tolerated.

"In 1959, severe earthquakes resulted from sudden movement along two major faults in the vicinity of Lake Hebgen a few miles south and west of West Fork. Heavy damage was sustained in the immediate area of Hebgen Lake. While the entire region was severely shaken, no damage was reported from West Fork. However, this event plus the evidence of fault movements in the West Fork area in the relatively recent geological past, point to the clear need to consider all land use planning and construction from an earthquake hazard point of view. Of particular importance is recognition of the extreme hazard to permanent buildings or visitor sites located beneath rock cliffs, or near or on former landslide movements. The size of reservoirs should be kept to the minimum consistent with flooding should landslides displace water or breach the dams.

"Esthetically, the rich geological history of this area, including the great episodes of sea flooding, the development of the Spanish Peaks along a dominant compressive fault line that runs through the West Fork and provides the structural setting for this basin, the volcanic episodes which showered ash and lava, and finally the glacial epoch in which giant streams of ice descended all major streams to the lower village site with resulting disruption of all previous topographic and geologic expression, -- these are to be documented and will become part of the record of intersting natural features to be interpreted for the public interest."

4. Climate

The Water Resources Survey, Gallatin County, Montana, published by the State Engineer's Office and dated January 1953 states, with regard to the climate of Gallatin County, "As is the case with most counties in the southwestern part of Montana, topography plays a very important part in the climate of Gallatin County. In general, the mountainous sections are both wetter and cooler than the fairly broad valley floors of the northern half. In the southern half, which is quite mountainous, January has the largest precipitation normally, but there is a secondary peak in June. In the northern valleys the wettest months normally are May and June, with a secondary maximum in September. Abundant snowfall during most winters assures a quite dependable supply of water for valley irrigation during the growing season. The spring season is usually fairly cool and cloudy, with frequent periods of either showers or general rain.

"Several periods of warm days with plenty of sunshine in the late summer and early fall are ideal for maturing crops and harvesting. Thunderstorms sometimes accompanied by hail are frequent from June through August. While hail can occasionally cause damage, widespread or severe damage is rare. Strong winds are sometimes observed in exposed areas, but Gallatin County is not known as one of the windy sections of Montana. Tornadoes are practically unknown."

Weather records indicate a high reading of 112° at Bozeman and a low of -66° at West Yellowstone.

5. Population

The permanent population of the area will show some growth in future years. The Department of Planning and Economic Development in their Environmental Impact Statement of March 22, 1971 states, "The permanent population in the area purchased by Big Sky has been three persons for the last number of years. If the area is developed per the Big Sky master plan, the permanent population will increase, especially at the Meadow Village. Big Sky's estimated employment at 300 persons may be composed of 150 commuters and 150 local residents. Of the 150 resident employees, one third or 50 persons may represent families living on Big Sky's land. These 50 families at two and one-half persons per family represent 125 persons which, together with the single employees, equals approximately 225 persons or population.

In addition to the permanent population which will be generated from the resort employment, there will be condominiums and second homes built in the area. The condominium development and second home development will take place in both the Mountain and Meadow Villages. Some permanent population will develop, but the transient tourist population will be the overriding population impact upon the area. This population may vary in the 1980's from 3,000 to a peak of 6,000 persons during the Christmas holidays or at spring break."

6. Economic Activity

The economic base of the Gallatin Canyon is dependent primarily on ranching, logging and recreation. Little change can be expected in ranching and logging activity; however, a significant growth is foreseen in winter recreation. This will provide a better balance in the economy of the area.

The Montana State University preliminary report of April, 1971, "The Impact of a Large Recreational Development Upon a Semi-Primitive Environment: A Case Study", states: A survey of the businesses in the Gallatin Canyon, between Spanish Creek and the Grayling Creek Divide, was made during the summer of 1970. There are 10 business establishments, of which 5 are strictly 'guest ranches'. The other 5 are combinations of cabins, cafes, bars, gasoline and other minor services. One had space for campers and trailers.

"Together, the businesses employ a total of about 85 people during the peak two months, using mostly local help and college students.

"The total sleeping accommodations are about 350, including about 200 at guest ranches. Cafe capacity, other than the guest ranches, is about 150 people. The accommodations for special meetings are few and small.

"Annual volume of business for those reporting was less than $100,000 per business.

"Guest ranches generally operate at capacity and so do not expect much impact directly on their business from Big Sky. Other businesses expect a positive impact.

"Data has been collected on bank debits and deposits; number and wages earned by the labor force in Gallatin County; vehicle assessments (truck and automobiles); Montana Power Company electrical installations, service attachments, etc.; and Mountain States Telephone service connections (commercial and private). Additional indicators of business impact will be obtained and analyzed, including the sizes, kinds and number of businesses in Bozeman, Belgrade, Manhattan and Three Forks. Data is being gathered for enough years to give some indication of past trends which then can be used to project the baselines in the absence of the Big Sky resort development. Although analysis of data has not yet been completed, there is a definite increase in all types of business activity as measured by the above indicators."

7. Fish and Wildlife

The project area is inhabited by deer, elk, moose, bear and many smaller species of wildlife. Streams such as the West Fork are populated primarily by rainbow trout.

The Gallatin National Forest Final Environmental Statement, Gallatin Exchanges Nos. 2 and 3 states, "The Big Sky project will have an effect on wildlife, both animal and fisheries. The Montana Fish and Game Department has stated, 'From a wildlife habitat aspect, a better site for this development could not have been selected. It is an area only lightly used by wildlife populations and contains no critical winter range areas that we are aware of. In fact, it is possible that upon the completion of the land and water development and the general change from a logging - livestock area into a recreational area, that the net effect will be a benefit to fish and wildlife populations.'"

8. Highway Facilities

In the past, the West Fork drainage has been served by a system of county and Forest Service roads.

This system provided the necessary access for ranching, timber harvesting and recreational uses. They were, however, narrow and poorly maintained, with little or no surfacing and inadequate provision for dissipation of storm runoff.

The development of a large recreational complex in the area requires that an all-weather highway facility be constructed to accommodate the traffic that will be generated.

An increase in traffic volume is also anticipated on U.S. 191 in the Gallatin Canyon. The 1969 ADT (Average Daily Traffic) on this section varies from 1299 near Gallatin Gateway to 665 for the segment within Yellowstone National Park. Without the Big Sky development, these figures project to 2250 and 1150, respectively, for the year 1992. It is anticipated that Big Sky will add 800 ADT to these figures, bringing the 1992 ADT to 3050 and 1950. Traffic volumes in this range can be handled adequately on a two-lane facility. Based on the above, it is assumed that no major reconstruction of U.S. 191 will be required.

II. PROBABLE IMPACT OF THE PROPOSED PROJECT

A. BROAD IMPACTS

The impact of this project is not so much a question of its own impact as it is one of the impact of what the project serves. A resort the size of Big Sky is a first in the State of Montana, although similar developments have been built in other states.

Big Sky will bring a $20 million resort, thousands of people and a new importance to an area that previously was virtually uninhabited by man.

The economic impact will be felt by a large area of southwestern Montana. Gallatin and Madison Counties will share in a substantially larger tax base. Restaurants, gas stations, hotels and motels, airlines and other tourist oriented businesses will benefit. Employment at Big Sky will provide approximately 300 jobs.

The condominiums and homesites will provide a place for people from urban areas to visit for a few days or weeks, or, for some, a place to make a permanent home. This project will not solve the problem of increasing urbanization but it will, in a small way, assist in reversing the rural-to-urban migratory trend by providing new economic opportunities and quality living in a basically rural outdoor setting.

There is a possibility that this highway may eventually be extended into the Madison Valley and connect with U.S. 287 near Ennis. Although an extension of the route has not been submitted to the Federal Highway Administration, considerable public sentiment has been expressed supporting this possibility.

The environmental impact of such an extension would be considerably greater than that envisioned for the Spur coming in from the Gallatin. The route would, for the most part, cross forest land not presently accessible by motor vehicle. No attempt will be made in this environmental statement to evaluate the feasibility or environmental impact of this extension. A separate study and environmental statement would be required prior to any decision with regard to this possibility.

B. IMPACTS ON THE NARROW BAND ADJACENT TO THE PROJECT

This project will have an effect on the area immediately adjacent to the roadway, both during and after construction.

The process of constructing a highway results in a temporary increase in air and water pollution. Contractors will be required to meet state air pollution standards with regard to dust control and air pollution control in order to keep air pollution to a minimum. Temporary and permanent erosion control methods and topsoil replacement and seeding will be employed.

State of Montana, Department of Highways Standard Specifications, Supplemental Specifications and Special Provisions provide specific instructions that the contractor must follow in meeting pollution control requirements.

Prior to the start of construction, the contractor is required to submit his schedules and methods of accomplishing temporary and permanent erosion control work for clearing and grubbing, grading, bridges and other structures at watercourses, construction, paving, haul roads, borrow areas and his plan for disposal of waste materials.

The contractor shall provide immediate erosion control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment. Such work may involve the construction of permanent or temporary berms, dikes, dams, sediment basins, slope drains and/or use of mulches, mats, seeding or other control devices or methods necessary to control erosion.

Noise levels during and after construction will be higher than at present, although logging activity in the past represented noise levels of a similar magnitude.

Some adjustments in the patterns and behavior of wildlife in the area can be expected. Although not as important as some other areas in the Gallatin, the West Fork does support a variety of wildlife species. Their adjustments will vary, with some species avoiding the area and others being attracted to it for one reason or another.

Localized fluctuations in the water table can be expected in areas immediately adjacent to the roadway construction. Portions of the project area have a very high water table and where this condition exists, it may be necessary to sub-excavate unsuitable material and backfill with granular material in order to protect the roadway from settlement failure or the action of frost in the subgrade.

There are no 4(f) lands or historic sites in the project area.

The project will provide a fast, safe, efficient and scenic highway facility for the public to travel. This type of facility is necessary for emergency vehicles, busses and commercial vehicles, as well as the general public. It will enable people to reach religious, educational, cultural and employment opportunities in addition to the recreational pursuits.

III. PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

A minimal amount of air and water pollution will occur during and for a short period of time after construction. Noise levels will be higher than at present.

The commitment of right-of-way for the road will remove this land from its present use and will preclude its being used for other purposes as long as the roadway exists.

IV. ALTERNATIVES

A. LOCATION CRITERIA

In determining the most suitable location for this project, the following items were considered:

1. Horizontal Curvature

The horizontal alignment in mountainous terrain such as encountered on this project needs to be one which follows, as nearly as possible, the contour of the existing terrain. For this reason, the design standards for the project allow for horizontal curves of $12^{\circ}30'$. Because of the limitations of the terrain, an exception to these standards will be made in one area and two curves of 15° will be used. The curvature of the roadway will be designed so that the impact on the environment is kept to a minimum.

2. Grades

Winter travel in this area will involve snowpacked and icy roads for much of the season. Steep grades increase the hazards associated with slick roads. The design standards provide for grades up to 7%. Grades will be held to a minimum compatible with the terrain.

3. Exposure

Roadways with a south exposure receive the maximum amount of sunshine which results in a minimum amount of icy roads. The route will maintain primarily a south exposure.

4. Existing Roadway

The existing Forest Service road has introduced one roadway scar in the area. Where possible, the new roadway will follow the old road to keep cut and fill scars to a minimum.

5. Landslides

As pointed out earlier in the discussion of the geology of the area, there are existing landlides and potential landslide conditions along the route. These areas vary in size and degree of activity.

Studies have been made of areas where slides have occurred or are likely to occur. The alignment will avoid these areas where possible or special design features will be incorporated into the plans to preclude their becoming a problem.

B. DESCRIPTION OF ALTERNATES

For most of the route it was possible to establish a location which met the criteria. The location follows the existing roadway except where alignment and grade dictated otherwise. The exposure is good throughout.

A study of alternate alignments was required between Station 170± and Station 320± because of a landslide area at approximately Station 280. This slide is quite extensive, 300' wide and 400' long. Conditions are such that the cost of correction, if indeed feasible, would be enormous. Five alternate lines have been studied in this area. Exhibit B illustrates the alternate lines.

1. Alternate "A"

Alternate "A" would stay on the south side of the Middle Fork for a distance of about 1 mile, then would cross the Middle Fork and climb an unnamed draw to near an old sawmill. It would continue to climb to a ridge above the slide area and then contour around to a point where it would rejoin the existing roadway.

This alternate would cross an old slide area in the first mile. This slide appears stable, however, special design features would be required to prevent activating the slide as a result of construction.

The grade coming up from the Middle Fork would be about 7.5%. High cuts and fills would be required because of the restrictions imposed by the steep grade.

2. Alternate "B"

Alternate "B" would cross the Middle Fork in the same location as the existing roadway, climb and cross the North Fork below the existing road, climb the slope on the north side of the Middle Fork, cross the unnamed draw and joint Alternate "A".

This alternate would require a high fill in crossing the unnamed draw. The foundation material in the draw is capable of supporting a high fill. Maximum grade would be 7%.

3. Alternate "C"

Alternate "C" would depart from Alternate "B" near the crossing of the Middle Fork. It would follow the North Fork to a crossing above the existing road. It would then follow higher on the slope above the Middle Fork and join Alternates "A" and "B" near the old sawmill.

This alternate would require a fairly high fill across the North Fork. This fill would be in an area which Big Sky plans to develop into an equestrain area with bridle paths, a rodeo grounds and an amphitheater. The roadway in this location could lessen the areas attractiveness for these uses.

4. Alternate "D"

Alternate "D" would cross the unnamed draw in the same location as Alternate "B". It would then proceed to pass below the slide area and join the other alternates at the end of the study. This alternate would involve a very high fill across the unnamed draw. Grades in excess of 9% would be required to gain the necessary elevation.

5. Alternate "E"

Alternate "E" would be a modification of Alternate "D" in an attempt to reduce the height of the fill across the unnamed draw and to lengthen the line which would lessen the grade.

This modification accomplishes a major reduction in the fill height, however, grades in excess of 8% would still be required to reach the necessary elevation.

C. THE "DO-NOTHING" ALTERNATE

The "do-nothing" alternate may have appeal to the group of people who would prefer that Big Sky not be built. This would present a hardship for the developer, might limit economic opportunities in the area and could greatly inconvenience future residents of the area. Furthermore, it might not represent the most desirable alternate from an environmental standpoint.

It is relatively certain that Big Sky will proceed with their development and a roadway is required to transport people to the upper area. Should they be forced to use the existing roadway, or some less expensive modification of the existing roadway, the result would be heavy volume of traffic on a low-class roadway with poor drainage, very little surfacing, steep slopes and little or no ditch. The resultant dust, mud and erosion could be substantial and very detrimental. From a safety standpoint, this would also be less than desirable.

The proposed highway will provide access to recreational facilities that are open to the general public. It will also provide access to privately owned property and public domain lands.

V. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Construction of the highway facility will require disruption of the land surface, removal of timber within the construction limits and a temporary increase in air and water pollution. However, when completed and when revegetation has been established, the project will provide a road with stable slopes, proper drainage and a minimum of environmental degradation. The highway will provide a fast, safe and efficient transportation facility for the traveling public.

The area is undergoing a change in land use. This change will be aided by the provision of a modern highway. Whether the highway is constructed or not, there is no doubt that the land use change will continue.

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The land acquired for right-of-way will no longer be available for timber production or livestock grazing. This acreage, however, is not of sufficient quantity to be significant.

Also, the gravel used in the roadway surfacing will be irretrievable, but here again the quantities involved are not significant.

The greatest commitment of resources involved is the change in land use that will result. The highway improvement will act as a catalyst for this change. The change in land use from ranching and timber harvesting to primarily recreational use will be desirable for future generations.

VII. EXHIBITS

EXHIBIT A

LOCATION MAPS

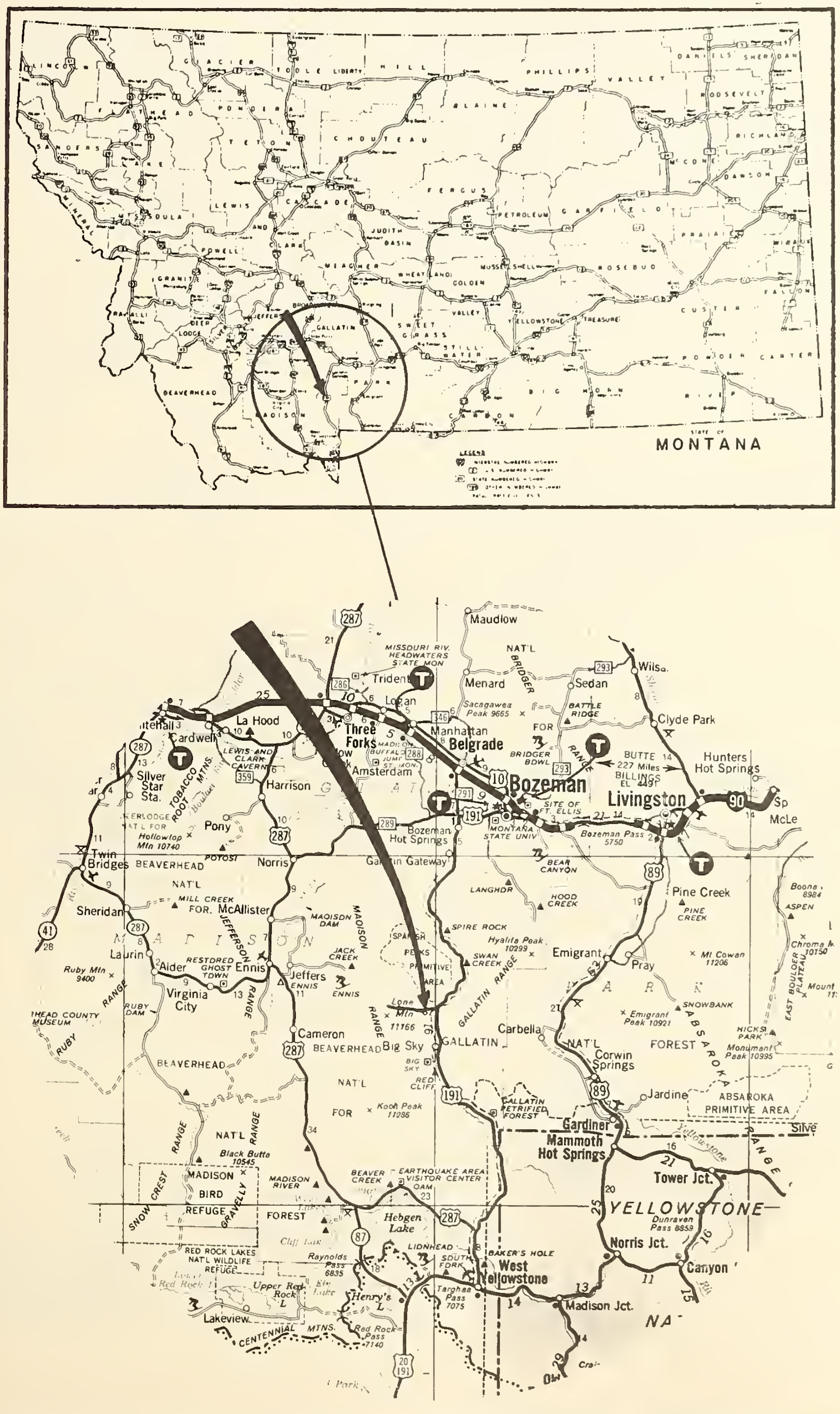

EXHIBIT "B"

MAP OF ALTERNATES
F-20(1)
U.S. 191 SPUR
SCALE 1"=500'±

EXHIBIT "E"

MAP OF ALTERNATES
F-20(1)
U.S 191 SPUR
SCALE 1" = 500'±

THE GREAT SEAL OF THE STATE OF MONTANA
ORO -Y- PLATA